

**What is claimed is:**

1. A compiler for generating object code from an input source program, the compiler comprising:

5 a syntax analyzer configured to analyze whether or not an operation described in the source program conforms to grammatical rules, and to analyze whether or not a combination of the operations defines an intrinsic function and details of processing operations of the intrinsic function;

10 an intrinsic function definition database configured to store a definition of the intrinsic function and the details of the processing operations of the intrinsic function, as analyzed by the syntax analyzer;

a code generator configured to generate machine  
15 instructions from the source program based on a result of the processing of the syntax analyzer; and

a code optimizer configured to optimize the machine instructions to machine instructions corresponding to the details of the processing operations of the intrinsic function,  
20 in a case where a string of the machine instructions generated by the code generator are in agreement with the details of the processing operations of the intrinsic function stored in the intrinsic function definition database.

25 2. The compiler of claim 1, further comprising a lexical analyzer configured to divide the operations

described in the source program into tokens, wherein

the syntax analyzer analyzes whether or not the tokens conforms to grammatical rules, and analyzes whether or not the combination of the tokens defines the intrinsic function and  
5 the details of the processing operations of the intrinsic function.

3. The compiler of claim 1, wherein the syntax analyzer inputs the definition of the intrinsic function and the details  
10 of the processing operations of the intrinsic function from an intrinsic function information file different from the source program.

4. The compiler of claim 1, wherein the definition of  
15 the intrinsic function includes information of parameter types and an identification name.

5. The compiler of claim 2, wherein the definition of the intrinsic function includes information of parameter types  
20 and an identification name.

6. The compiler of claim 3, wherein the definition of the intrinsic function includes information of parameter types and an identification name.  
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7. The compiler of claim 1, wherein plural definitions

of details of the processing operations can be defined in the intrinsic function definition database relative to a single intrinsic function.

5           8.       The compiler of claim 2, wherein plural definitions of details of the processing operations can be defined in the intrinsic function definition database relative to a single intrinsic function.

10           9.       The compiler of claim 3, wherein plural definitions of details of the processing operations can be defined in the intrinsic function definition database relative to a single intrinsic function.

15           10.      The compiler of claim 4, wherein plural definitions of details of the processing operations can be defined in the intrinsic function definition database relative to a single intrinsic function.

20           11.      The compiler of claim 1, wherein the definition of the intrinsic function and the details of the processing operations of the intrinsic function can be described by C language.

25           12.      The compiler of claim 1, wherein the definition of the intrinsic function and the details of the processing

operations of the intrinsic function can be described by hardware description language.

13. A computer implemented method of compiling for  
5 generating object code from an input source program, the computer implemented method comprising:

analyzing, by a syntax analyzer, whether or not an operation described in the source program conforms to grammatical rules, and analyzing, by the syntax analyzer, whether or not a combination  
10 of the operations defines an intrinsic function and details of processing operations of the intrinsic function;

storing a definition of the intrinsic function and the details of the processing operations of the intrinsic function, as analyzed by the syntax analyzer in an intrinsic function  
15 definition database;

generating, by a code generator, machine instructions from the source program based on a result of the processing of the syntax analyzer; and

optimizing, by a code optimizer, the machine instructions  
20 to machine instructions corresponding to the details of the processing operations of the intrinsic function, in a case where a string of the machine instructions generated by the code generator are in agreement with the details of the processing operations of the intrinsic function stored in the intrinsic  
25 function definition database.

14. The computer implemented method of claim 13, further comprising

dividing, by a lexical analyzer, the operations described in the source program into tokens, wherein

5 in the analyzing by the syntax analyzer, whether or not the tokens conforms to grammatical rules is analyzed, and whether or not the combination of the tokens defines the intrinsic function and the details of the processing operations of the intrinsic function is analyzed.

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15 15. The computer implemented method of claim 13, wherein the definition of the intrinsic function and the details of the processing operations of the intrinsic function are inputted, by the syntax analyzer, from an intrinsic function information file different from the source program.

16. The computer implemented method of claim 13, wherein the definition of the intrinsic function including information of parameter types and an identification name are analyzed by  
20 the syntax analyzer and stored in the intrinsic function definition database.

17. The computer implemented method of claim 13, wherein plural definitions of details of processing operations can be  
25 defined in the intrinsic function definition database relative to a single intrinsic function.

18. The computer implemented method of claim 13, wherein  
the definition of the details of the processing operations of  
the intrinsic function described by C language is analyzed by  
5 the syntax analyzer.

19. The computer implemented method of claim 13, wherein  
the definition of the intrinsic function and the details of the  
processing operations of the intrinsic function described by  
10 hardware description language is analyzed by the syntax analyzer.

20. A program development tool for designing an  
application program for a processor installed user-defined  
hardware, the program development tool comprising:

15 a compiler for generating object code from the application  
program comprising

a lexical analyzer configured to divide an operation  
described in the application program into tokens,

a syntax analyzer configured to analyze whether or  
20 not the tokens conform to grammatical rules, and to input a  
hardware definition of a user-defined instruction and convert  
the input hardware definition into a definition of the intrinsic  
function and details of processing operations of the intrinsic  
function,

25 an intrinsic function definition database  
configured to store the definition of the intrinsic function

and the details of the processing operations of the intrinsic function, converted by the syntax analyzer,

a code generator configured to generate machine instructions from the application program based on a result of  
5 the processing of the lexical analyzer and a result of processing of the syntax analyzer, and

a code optimizer configured to optimize the machine instructions to machine instructions corresponding to the details of the processing operations of the intrinsic function,  
10 in a case where a string of the machine instructions generated by the code generator are in agreement with the details of the processing operations of the intrinsic function stored in the intrinsic function definition database; and

a simulator configured to debug the application program  
15 compiled by the compiler.